

Paul Scherrer Institut
CH-5232 Villigen PSI

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Patent Claims

1. A process for the synthetic generation of methane from a feed gas mixture comprising carbon monoxide, hydrogen and water vapour and optionally C₂ components and/or aromatic hydrocarbons; said process comprising the steps of:
- 10 a) bringing the feed gas mixture in contact with a fluidized bed catalyst having catalyst particles which comprise as catalytic active component a metal and/or a metal compound or a mixture thereof under the circumstances of:
- 15 b) an elevated temperature in the range of 250 to 500°C;
- c) a feed gas pressure in the range of 0.8 to 70 bar;
- d) an gas hourly space velocity of 1000 to 50000 h⁻¹; and
- 20 e) an concentration of H₂/CO in the initial gas mixture in the range of 0.25 to 5.
2. The process according to claim 1, characterized in that the catalytic active component is nickel and/or a nickel compound, preferably a mixture of nickel and nickel oxide,
- 25 disposed on an ceramic carrier, such as Al₂O₃, TiO₂, SiO₂ or Y₂O₃ or mixtures thereof.
3. The process according to claim 2, characterized in that
- 30 the content of the catalytically active component is in the range of 20 to 100 weight%, preferably 40 to 60 weight%, as compared to the weight of the catalyst particles.

4. The process according to claim 1, 2 or 3,
characterized in that

the size of the catalyst particles is in the range of 10 to
5 1000 μm , preferably in the range of 50 to 500 μm .

5. The process according to anyone of the preceding claims,
characterized in that

the feed gas mixture comprises C_2 components and/or aromatic
10 hydrocarbons, such as benzene, toluene and naphthalene, in the
range of less than 10 Vol%, preferably less than 5 vol%.

6. The process according to anyone of the preceding claims,
characterized in that

15 the gas hourly space velocity is in the range of 2000 to 10000
 h^{-1} , the temperature is in the range of 340 to 400°C and the
gas pressure is in the range of 1 bar.

7. The process according to anyone of the preceding claims,
20 characterized in that

a mean residence time of the feed gas mixture in the fluidized
bed catalyst is in the range of 0.1 to 5 sec., preferably 0.2
to 1 sec.

25 8. The process according to anyone of the preceding claims,
characterized in that

the content of H_2/CO in the feed gas mixture is in the range of
0.8 to 2.